



Development of an Index of Habitability en los **Indios**

Principal Investigator:

Patricia **Bilhgs**



Investigators:

Maria Escano



Charles Eastman



Ricardo Alvaro

Universidad de Ron

Eleuterio Ines

Post Doctoral Fellow



Research Topics

Space motion sickness

Post-flight orthostatic intolerance

Performance in high stress environments

Role of behavioral adaptation



Technical ad□ gro□n□

□□ Often space flight affects physiology that associate adverse effects on crew performance and health

□□ Several factors like overloading isolation fatigue etc. are known to affect operational efficiency

There is a wide range in technological environments to adapt to space and adapt to Earth

□□ There are crew complements: men and women from different cultural backgrounds and professional backgrounds and physical condition



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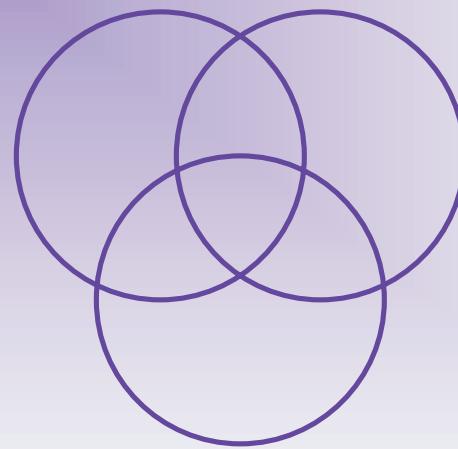
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Converging Indicators

Physiology
HR



Selective tasks
to support



Psychobiological database

Populations studied approach an open

astronauts and cosmonauts

military personnel in combat vehicles

search and rescue pilots

college students

patients

Research environments

mission simulators and centrifuge

combat vehicles and aircraft

space and



Research Questions

- How do biological patterns identify good and poor adapters in stressfulness environments?
- Does performance impact performance and are its physiological effects? Identify biological profiles characteristic of individuals least and most protected?
- Does performance biological training affect performance in high stress environments? Identify individual differences in physiological control factors as predictors of performance?
- Are converging indicators provide a good overall performance and is it a reliable assessment tool?



■■■■■ Project ■■■■■

- develop custom tools to analyze processing and editing physiological data
- port physiological database to package in platform
- build integrated database to include performance and other metrics
- process and analyze existing data from individual mission research
- develop analytical tools to evaluate and predict individual performance in high stress environments



Data Processing Software

- stores designed programs
- processes analog signals
- serves interactive editing of artifacts
 - lowpass filtering
 - linear interpolation
 - setting thresholds
- generates output files
 - edits raw data files
 - processes second scans
 - ties series plots

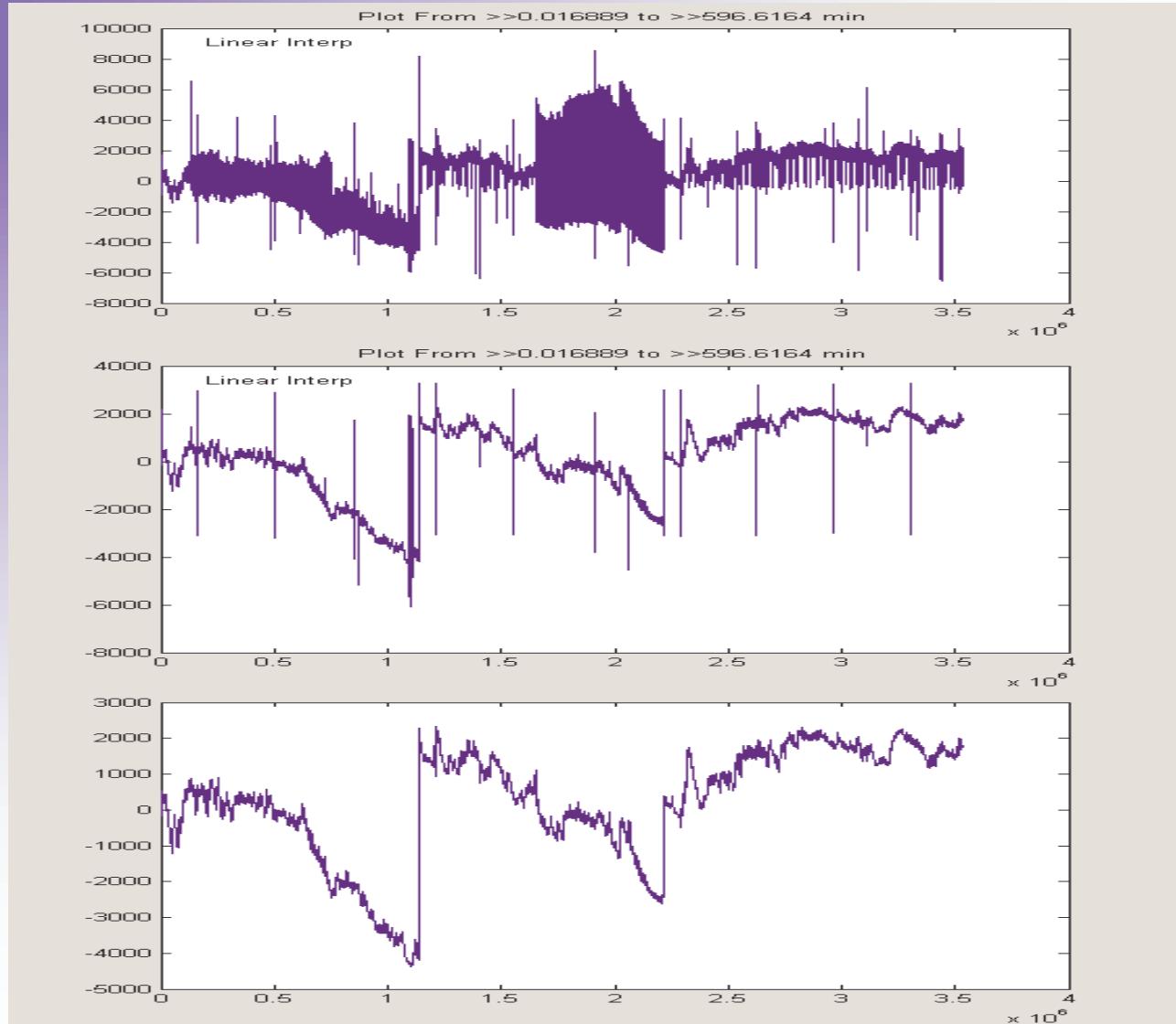


Processing in Distance

raw noise signal
with noise

low pass filter to
remove noise

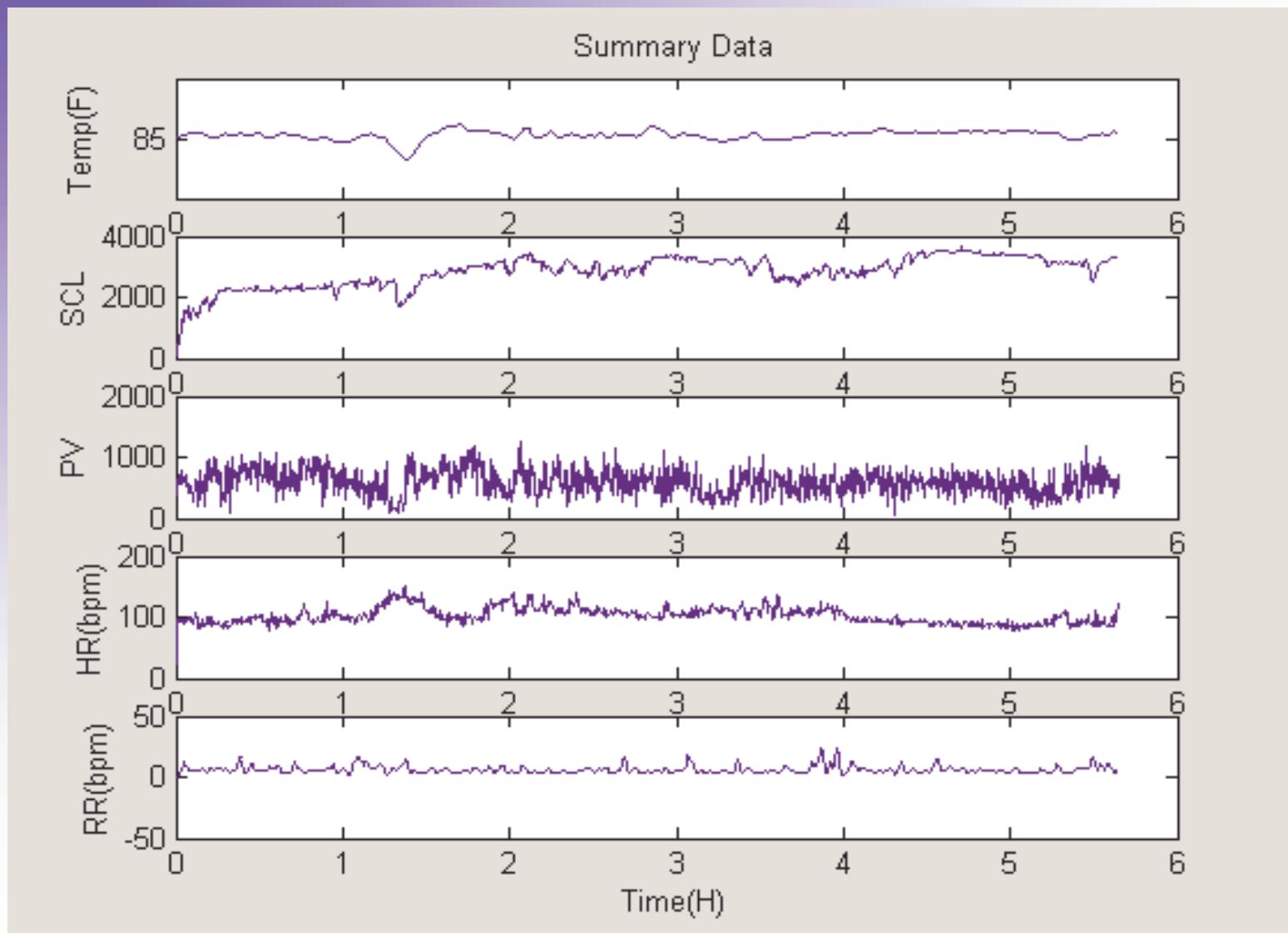
linear interpolate to
remove spikes





Process ~~Step~~ tip ~~the~~

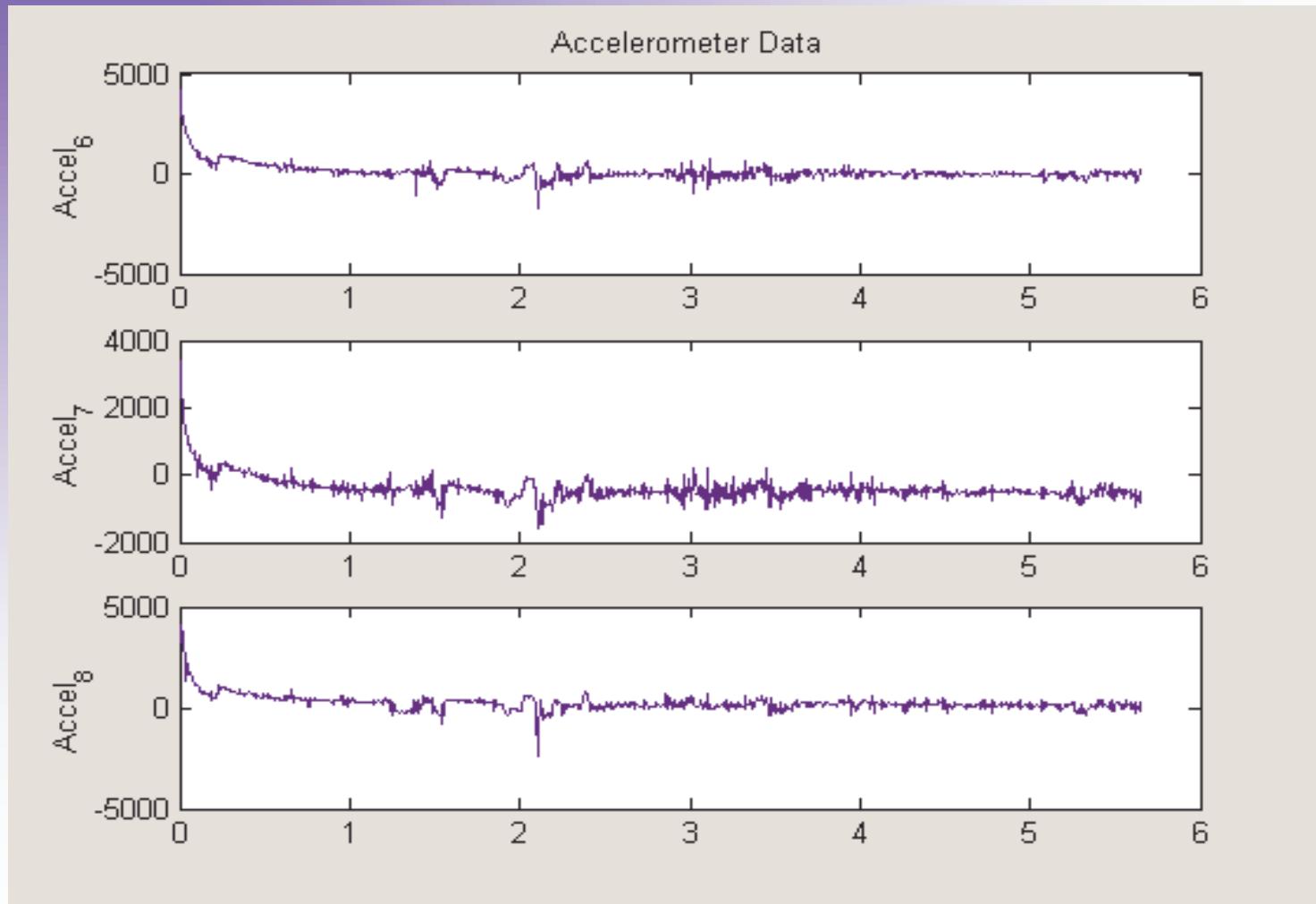
15-second means (5 channels)





Processed tip file

1 second means 3 channels





data analysis approach

process and edit physiological data from analog tapes

combine physiological data for analysis

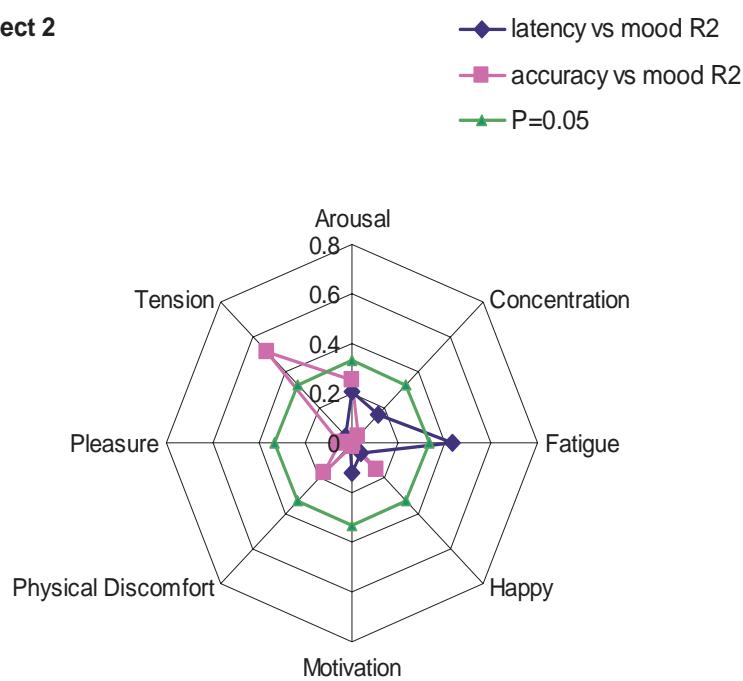
analyze variables and compute cross-correlations and
multivariate statistics

design and apply neural networks to data

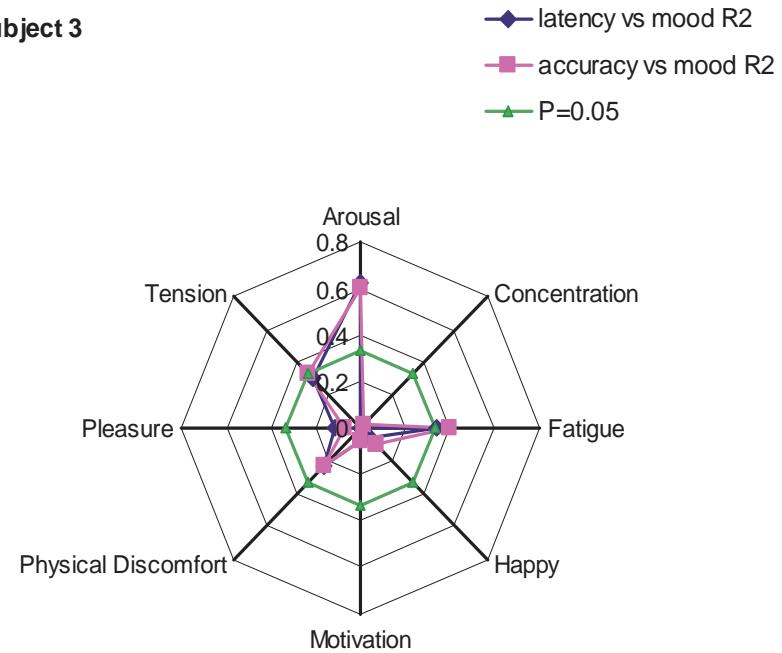


Opposite Performance: RSS correlation coefficients with different states

Subject 2



Subject 3

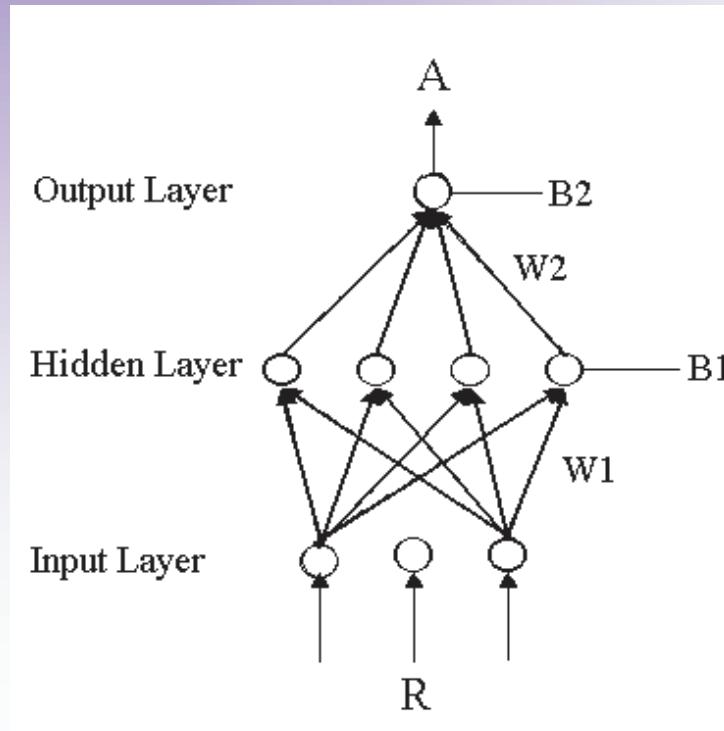




Artificial neural networks

Artificial neurons that can be trained to perform complex functions by solving complex problems

General idea





Official editorial editor(s)

Editor(s):

computes error signal difference between desired and computed temperature requests signals until mean square error zero

Objectives:

design to generalize across different data sets robust model and fast responses

classification performance optimization based on multiple eigenvectors variables



Official editor's proposal design

- take: official editor's proposal
- create: tree-later Lee-Brown
- tip talker: multiple physiological parameters
- tip talker: composite performance
- training: acrophobia etiology
- alienation criteria: can share error 100%



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Issues

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